Project Brief

Project Title: Sales Performance and Product Analysis for E-commerce Optimization

Group: 2

Project Overview:

Analyzing the purchases of our customers for 1 year in America E-commerce dataset. How are their customer's online buying habits?

Dataset Description:

The dataset includes information about customer behavior, product details, and transactions. The dataset can be found here (https://www.kaggle.com/datasets/mervemenekse/ecommerce-dataset)

Columns name and meanings:

Order_Date: The date the product was ordered.

Aging: The time from the day the product is ordered to the day it is delivered.

Customer_id: Unique id created for each customer.

Gender: Gender of customer.

Device_Type: The device the customer uses to actualize the transaction (Web/Mobile).

Customer_Login_Type: The type the customer logged in. Such as Member, Guest etc.

Product_Category: Product category

Product: Product

Sales: Total sales amount

Quantity: Unit amount of product

Discount: Percent discount rate

Profit: Profit

Shipping_cost: Shipping cost

Order_Priority: Order priority. Such as critical, high etc.

Payment_method: Payment method

Project Goals:

The objective is to analyze the store's sales data to gain insights into its performance. The company wants to identify the top-selling products, highest-grossing months, and trends in different product categories and buying platforms.

Project Tasks:

1. You will complete the following tasks using SQL:
    - What devices do my customers use to reach me?
    - Who is the customer base?
    - What product categories am I selling?
    - Which product categories do I sell to whom? (Gender Distribution by Category or Product?)
    - Which login type do my customers prefer when shopping?
    - How does the date and time affect my sales? (Total sales by month, the days of week or time arrival)
    - From which product do I earn the most profit per unit?
    - How is my delivery speed and order priority? (Delivery Time distribution of order priority by months)

2. **Sales Performance by Month:**

    - Calculate total sales for each month over the time period covered by the dataset.
    - Identify the month with the highest sales and analyze the factors contributing to the peak.

3. **Top 5 Best-Selling Products:**
    a. Determine the top 5 best-selling products based on the total quantity sold.
    b. Provide insights into the characteristics of these products, such as price range, category, and sub-category.
4. **Sales by Product Category:**
    a. Analyze total sales by product category to determine which categories contribute the most to revenue.
    b. Calculate the percentage contribution of each category to the overall sales.
5. **Revenue Generation by Order:**
    a. Calculate the average sales per order.
    b. Identify the top 5 orders by total sales amount and analyze which products contributed the most to these orders.
6. **Discount Impact Analysis:**

a. Analyze the impact of discounts on sales performance. Determine if products with discounts are sold more frequently or generate higher revenue than non-discounted products.
b. Provide recommendations on whether to continue offering discounts based on your findings.

Expected Deliverables:

1. **SQL Queries:**
    - Submit all SQL queries used to perform the analysis for each task.
    - Queries should be well-documented, with explanations of the logic behind each step.
2. **Data Insights Report:**
    - Provide a detailed report summarizing the key findings and insights derived from the sales performance analysis.
    - Include visualizations where necessary to highlight trends and comparisons (e.g., sales over time, top products, and categories).
3. **Presentation:**
    - Prepare a presentation (5-10 slides) summarizing the key insights and recommendations based on the analysis.
    - Be prepared to discuss your approach, how you used the data, and how the business can apply these insights to improve its sales strategy.

Skills and Concepts to Apply:

- **SQL Queries:** Use SQL to extract and manipulate data, leveraging JOIN, GROUP BY, ORDER BY, HAVING, subquery, window functions e.t.c.
- **Aggregations:** Calculate total sales, average order values, and other key performance metrics.
- **Trend Analysis:** Perform month-over-month sales trend analysis to identify seasonality and high-revenue periods.
- **Product Performance:** Evaluate product sales and analyze the contribution of different categories.
- **Reporting:** Summarize your findings and provide clear, actionable recommendations for improving sales performance.

Tools:

- SQL Server
- Optional: Data visualization tools like Excel, Power BI, or Tableau for visualizing insights.

Evaluation Criteria:

- Correctness and complexity of the SQL queries.
- Depth and relevance of the insights derived from the data.
- Quality and clarity of the report and presentation.

- Application of advanced SQL functions (e.g., window functions, subqueries, etc.) and analysis techniques.
- Team collaboration and communication during the presentation.